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Task Force.

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10) Arden L. Bement, Jr.

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July 1980

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RESEARCH AND
ENGINEERING

OFFICE OF THE UNDER SECRETARY OF DEFENSE

WASHINGTON, D.C. 20301

19 AUG 1980

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ELECTED
AUG 7 1981

MEMORANDUM FOR THE DISTRIBUTION

SUBJECT: Forwarding of the DoD Laboratory Management Task Force Report

The Report of the DoD Laboratory Management Task Force is forwarded for your information and use. This Report, which has been approved by the Under Secretary of Defense for Research and Engineering, provides the basis for the Laboratory Management Task Force to proceed, in conjunction with responsible offices in OSD and the Military Departments, to develop action plans to implement the recommendations presented.

I wish to thank the many individuals who contributed to the work of the DoD Laboratory Management Task Force and who participated in developing the Service Laboratory Resource Management plans. The working processes of the Task Force provide an excellent example of how effective communications and teamwork can deal with complex management problems.

These are but the initial steps in our program to maintain the vitality of our DoD Laboratories and to increase their productivity. I solicit the continued support of all members of the DoD R&D management community in this worthwhile endeavor.

Arden L. Bement, Jr.
Arden L. Bement, Jr.
Deputy Under Secretary of Defense
for Research and Engineering
(Research and Advanced Technology)

Attachment

DISTRIBUTION STATEMENT A

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DoD LABORATORY MANAGEMENT TASK FORCE

FIRST INTERIM REPORT TO THE SECRETARY OF DEFENSE

CHAIRMAN DR. ARDEN L BEMENT, JR.
DEPUTY UNDER SECRETARY OF DEFENSE
FOR RESEARCH AND ENGINEERING
(RESEARCH AND ADVANCED TECHNOLOGY)

JULY 1980

This presentation will provide orientation to the work of the Laboratory Management Task Force and an overview of progress to date. The report contains recommendations for action at various levels of the Office of the Secretary of Defense (OSD) and within the Military Departments. We are firmly convinced that implementation of these recommendations can significantly enhance the vitality of the laboratories and improve the productivity of DoD Research, Development, and Acquisition (RDA) activities.

If implementation is initiated promptly, we believe that the benefits should be fully apparent within two to three years. We also believe that with sustained management attention the contribution of the laboratories can be brought to an all-time peak within the 1980's.

Upon acceptance of the report, it will be provided to the Secretariats of the OSD and the Military Departments, to the Service Acquisition Chiefs, to the Joint Logistics Commanders, and to others including the laboratory communities.

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The presentation will cover the above general outline. We will indicate how this effort got started, who the principal players have been, and what those before us did; then give our feelings for the current situation. We will then summarize our findings and recommendations for action, and provide a set of specific analyses and steps for progress.

We emphasize that the Report overview is supported by an extensive array of documentation and participant examinations, including individual Service Laboratory Resource Management Plans.

BACKGROUND

- **FIRST JOINT MEETING OF DoD LABORATORY DIRECTORS—JUNE 1978**
- **REPORT OF AD HOC GROUP TO EXAMINE IMPACT OF MANAGEMENT CONSTRAINTS ON THE DoD LABORATORIES— SEP 1979**
- **SECDEF MEMORANDUM ESTABLISHING DoD LABORATORY MANAGEMENT TASK FORCE (LMTF)— OCT 1979**

The perception that a multiplicity of resource controls on laboratory operations were counterproductive became increasingly evident in the late 1970's. At the 1978 Laboratory Directors Conference, the laboratory community expressed its growing alarm about the adverse effects that individual controls collectively produce. This concern was reiterated at the Congressional level, particularly by the House Armed Services Committee during Fiscal Year 1979 hearings. The declining adequacy of the U.S. military equipment was clearly the concern underlying this attention.

As a result, an ad hoc task group of senior level executives examined the apparent situation. They concluded that the laboratories were being seriously injured by a collection of controls and that the situation was common to the three Services.

Accordingly, these findings were brought to the attention of the Secretary of Defense and he directed the establishment of a formal DoD Laboratory Management Task Force (LMTF) to address ways to improve the vitality of our laboratories. The Task Force operates under the chairmanship of the Deputy Under Secretary of Defense for Research and Engineering (Research and Advanced Technology) and is composed of a broad array of senior level representatives from within the DoD.

TASK FORCE PARTICIPATION

COMPOSITION

OSD

OUSDRE (R&AT)
OASD (MRA&L)
OASD (C)
DARPA

ARMY

OASA (RDA)
ODCSRDA
HQ DARCOM

NAVY

ASN (RE&S) / DNL
NADC
NRL

AIR FORCE

OASAF (RD&L)
AFSC-DL
AFSC-DLZ

PRIMARY SUPPORT

OASD (MRA&L)
OUSDRE (R&AT)

OASA (RDA)
HQ DARCOM
HDL
ARDL / ATL

OPNAV
NADC
DTNSRDC
NSWC
NOSC
ONR

AFWAL
AFSC

The Task Force initiated operation in January 1980, and is aggressively pursuing the issues as directed by the Secretary of Defense. Service representation is at three levels: the Secretariat, the Staff, and the Field. Additionally, numerous organizations have been assisting the principal members.

REPRESENTATIVE MAJOR STUDIES OF DoD LABORATORIES

- SECDEF TASK-97 STUDY GROUP (1961)
- BELL REPORT (1962)
- TASK-97 ACTION GROUP (1962-1964)
- FEDERAL COUNCIL FOR SCIENCE & TECHNOLOGY (1961-1973)
- CIVIL SERVICE COMMISSION (1967-1968)
- TASK GROUP ON DEFENSE IN-HOUSE LABORATORIES (1971)
- ARMY & NAVY MATERIEL ACQUISITION REVIEWS (1973-1978)
- DoD LABORATORY UTILIZATION STUDY (1975)
- GAO REPORTS ON FEDERAL R&D LABORATORIES (1979)

We are aware that laboratories--whether in Government or industry--are a lightning rod for concerns about science and engineering. The DoD laboratories are no exception. They have been the subject of intensive and recurring studies for several decades. We have tracked studies as far back as one by Dr. Von Karman in 1945.

The slide shows a few of the more significant studies of the past 20 years. We believe it worthwhile to take a few moments to highlight some of the general findings, recommendations, and results of such studies.

PRINCIPAL FINDINGS OF PAST STUDIES

- **LABORATORIES VITAL TO DEFENSE RDA**
- **LABORATORIES CONTRIBUTION IS CONSTRAINED BY—**
 - INHIBITING PROCEDURES
 - INADEQUATE PAY
 - AGING FACILITIES
 - MISMATCHED WORKLOAD AND MANPOWER
- **CORRECTIVE ACTIONS ARE REQUIRED**

Rather consistently, past studies have produced findings essentially the same as those summarized on the chart. Considering the fact that these study groups frequently were composed of eminent people from outside and within the DoD, this general consistency is especially notable. Even within the detailed findings we have found the same high degree of focus.

GENERAL RECOMMENDATION OF PAST STUDIES

- IMPROVE FACILITIES AND STAFF
- UPLIFT QUALITY OF TECHNICAL LEADERSHIP AND MANAGEMENT
- GIVE LABORATORY LEADERSHIP AUTHORITY AND FLEXIBILITY

Equally noteworthy has been the consistency of the various recommendations.

OBSERVATIONS

- **POSITIVE ACTIONS TAKEN WHICH IMPROVED THE ENVIRONMENT FOR LABORATORIES CONTRIBUTION**
- **BUT—ITS TIME FOR REVITALIZATION**
 - **CONSTRAINTS ON RESOURCES**
 - **MULTIPLE**
 - **INCREASING**
 - **LEAD TO INEFFICIENCY**
 - **SHORTAGE OF QUALIFIED SCIENTISTS AND ENGINEERS**
 - **HIGHLY COMPETITIVE MARKET**
 - **COMPLEX PERSONNEL AND MANPOWER POLICIES**
 - **MANAGEMENT AUTHORITY WEAKENED**

In general, the recommendations of these past studies have not been ignored. To varying degrees corrective actions have been undertaken—occasionally with striking success. For example, the Bell report resulted in the provision of specific discretionary funds for laboratory directors. The Civil Service Commission study produced significant improvements in personnel procedures. On the other hand, Project REFLEX, a highly regarded initiative to improve civilian manpower management, lost its momentum when the Services were placed under increasingly austere manpower constraints.

R&D managers are fully familiar with encumbrances such as those shown—and with their potential for undermining the contribution of laboratories. The Secretary of Defense recently stated that “periodic reattack of the problem is needed to scrape off the barnacles... fundamental change should also be looked at but will be harder to get barring some catastrophic twist.” We agree fully, and, like our predecessors, are working to provide a positive perspective.

THE URGENCY

THE CENTER OF GRAVITY IN THE COMPETITION BETWEEN THE TWO WORLD
OPPOSED SYSTEMS IS NOW TO BE FOUND PRECISELY IN THE FIELD OF SCIENCE
AND TECHNOLOGY, . . . MAKING FURTHER INTENSIVE DEVELOPMENT OF THE
LATEST SCIENTIFIC-TECHNICAL ACHIEVEMENTS NOT ONLY THE CENTRAL
ECONOMIC BUT ALSO A CRITICAL POLITICAL TASK, AND GIVING QUESTIONS OF
SCIENTIFIC-TECHNICAL PROGRESS . . . DECISIVE SIGNIFICANCE.

L. I. BREZHNEV

What then is new? What justifies renewed efforts to ensure the vitality of the DoD laboratories? The situation has been brought into all too sharp a focus by Mr. Brezhnev. The U.S. is faced with an extraordinary challenge in the area of technology. The technology challenge is not predominantly economic as in the competition with Germany, Japan, and several others. Technology has now become an extremely critical element in the protection of our national liberty.

THE RDA IMPERATIVE

- IMPROVE MANAGEMENT OF OUR SCIENTIFIC AND TECHNOLOGICAL RESOURCES
- EXPAND OUR TECHNOLOGICAL OPTIONS
 - STRENGTHEN TECHNOLOGY
 - MAKE BETTER USE OF INDUSTRY BASE
 - INCREASE COOPERATION WITH OUR ALLIES
- FIELD SYSTEMS WHICH EFFECTIVELY MEET MISSION NEEDS

Inherent in the urgency must be a continuing concern over the growing quantitative disparity between deployed U.S. and Soviet weapons. Equally important must be concern over significant advances in the quality of Soviet technology and field weapons. These concerns formulate the RDA imperative.

DoD RDA TEAM

- UNIVERSITIES
- INDUSTRY
- DoD DEPARTMENTS & COMPONENTS

KEY PLAYER: IN-HOUSE LABORATORIES

Through the years the in-house laboratories have had key involvements across the spectrum from research to stockpile. As major participants in the technology base and systems acquisition process, the cruciality of their performance becomes increasingly important in times of national urgency. They are a principal player for transferring DoD work to universities and industry. They have major responsibilities both in leading and in assessing the defense RDA work of the private sector.

LABORATORIES PROFILE

- **73 LABS SERVICE MANAGED**
- **60,000 PEOPLE—80% CIVILIAN—MEDICAL & AIR FORCE LABS—50% MILITARY**
- **\$5.2 BILLION ANNUAL PROGRAM—40% IN-HOUSE, RDTE \$3 BILLION—50% IN-HOUSE**
- **PHYSICAL INVESTMENT \$4 BILLION 50/50 REAL PROPERTY/EQUIPMENT**
- **SMALL AND LARGE <100 TO >4000**
- **PHYSICAL SCIENCE, LIFE SCIENCE, & PERSONNEL**
- **RESEARCH THROUGH THE FULL R&D SPECTRUM**

There are over 70 formally recognized DoD in-house laboratories—some large, some small—performing work in the physical, life, and social sciences in support of military and military civil works programs of the DoD. They constitute a large investment of dollars and manpower. Nearly two-thirds of the annual cash flow is RDTE money. About one-half of the R&D funds are contracted to universities and industry; the other half is retained by the laboratories to carry out roles requiring in-house personnel—including extensive activities necessary to support contract work. The balance of these funds are predominately procurement monies that are used for first acquisition of materiel systems and associated support, particularly product improvements. Most of this money is used for industry contracts.

DoD LABORATORY ROLES

- IDENTIFY, EVALUATE, EXPLOIT TECHNOLOGY HANDS-ON
- MINIMIZE TECHNOLOGICAL SURPRISE
- SOPHISTICATED BUYER
- PROCESS TECHNOLOGICAL CONCEPTS TO PROGRAM REALITY
- PERFORM OR MANAGE PROGRAM EXECUTION
- SYSTEMS SUPPORT
- UNDERTAKE ACTIVITIES HAVING EXTRAORDINARY RISK OR REQUIRING QUICK REACTION
- PROVIDE CORPORATE TECHNICAL MEMORY

As major participants in the technology base and in the systems development and acquisition process, the laboratories must respond to DoD needs to:

- Achieve equipment improvements which reduce the impact of projected manpower constraints;
- Obtain lower equipment production, operation, and support costs; and
- Direct substantial R&D effort toward the longer term technological deficiencies and opportunities—particularly through the revitalization of our technology base, the stimulation of prototyping and the use of mature U.S. and Allied technology, and the reduction of intelligence asymmetry and “technological surprises” in the face of a determined and well-supported Soviet competition.

LMTF FINDINGS

THERE ARE SIGNIFICANT BARRIERS IMPEDING EFFECTIVE ROLE PERFORMANCE:

- **MANAGEMENT FLEXIBILITY**
- **STAFF**
- **FACILITIES**
- **EQUIPMENT**

The Task Force's initial job was to access institutional problems. The members compiled analyses of management controls negatively impacting their respective areas of responsibility. This analysis centered primarily on personnel, funding, and contracting issues. Extensive background material was developed. A significant number of barriers have been identified. Most of these are restrictions and limitations placed on the use of specific categories of resources by functional offices outside the RDA management chain. They are usually imposed independently of one another and are often suboptimized with respect to the overall responsibilities of the DoD laboratories. The Task Force then set about determining whether these negative controls were common to all Service laboratories or, conversely, whether the Services were applying controls in notably different manners. The Task Force formulated tentative recommendations which, if implemented, have a high probability of improving the operating environment of the laboratory community.

As suggested by the Secretary of Defense, the Task Force also worked to identify actions of a more fundamental nature which would achieve a high degree of flexibility within a framework of controls that are operationally feasible and acceptable to the OSD and the Services. A significant challenge to the Task Force was their goal of balancing relief mechanisms with monitorship techniques in which top management can have high confidence.

ESSENTIAL ACTIONS

 • **TAKE CORRECTIVE ACTIONS ON ADDRESSED BARRIERS**

- **CONTINUE WORK TO IDENTIFY AND ADDRESS REMAINING BARRIERS**
- **ADOPT SELECTIVE APPLICATION PRINCIPLE FOR LABORATORIES**
- **PROVIDE FOLLOW-THROUGH ACTION AT OSD AND SERVICE LEVELS**
- **MONITOR PROGRESS**
- **ASSESS LABORATORIES VITALITY OVER TIME**

**KEY-ISSUANCE OF
DOD
LABORATORIES
ACTION AGENDA
FOR THE 1980's**

The Task Force has formulated a set of actions which it considers essential to the revitalization of the laboratories. The mechanics of implementing the initiatives contained in these actions vary broadly. Several require the personal support of the Secretary of Defense, others can be placed in effect by coordinative action in the OSD and the Military Departments, and a few can be accomplished within the respective Services.

Our perspective for these actions is both short- and long-term. We are convinced that if meaningful progress is to occur, the DoD must act promptly—and with sustained intensity. If this is not done, the LMTF effort will be just another study of laboratories in a very long list of such studies. Prior studies should be the point of departure; the DoD cannot afford to repeat them. "Backsliding" is a real danger. Our proposals are oriented toward minimizing this fatal weakness.

Accordingly, we will now address each of these actions.

ACTIONS

TAKE CORRECTIVE ACTIONS ON ADDRESSED BARRIERS

- ▷ • PERSONNEL & MANPOWER
- FACILITIES & EQUIPMENT
- PROCUREMENT & ACQUISITION

A wide array of barriers impede the performance of the laboratories. The LMTF confined its *initial* efforts to a select group of these barriers—primarily those considered to be particularly inhibiting but subject to reduction. These barriers fell into three groups: Personnel and Manpower (affecting the quality, quantity, and utilization of this key asset); Facilities and Equipment (affecting the inherent capability of the laboratories); and Procurement and Acquisition procedures (affecting the effectiveness of laboratory operations).

PERSONNEL & MANPOWER

- FREQUENTLY CHANGING MANPOWER CEILINGS
- HIGH GRADE REDUCTION
- SALARY COMPETITION
- TRAVEL AND TRANSPORTATION LIMITS
- INSPECTIONS AND AUDITS

Five issues have been addressed, bearing heavily on the workforce and the productivity of that workforce. For each of these issues we have identified the principal problem, impact, and corrective actions. Our recommendation correspondingly suggests who should take action. We have been deliberately precise in this matter: SECDEF means the Secretary of Defense; OSD means the Office of the Secretary of Defense; and DoD means the OSD and the relevant Military Departments.

PERSONNEL & MANPOWER

ISSUE: • FREQUENTLY CHANGING MANPOWER CEILINGS

PROBLEM: • SIZE, FREQUENCY AND SCHEDULING OF CHANGES

IMPACTS: • MANPOWER TURBULENCE (SIZE AND MIX)
• INEFFICIENT WORKLOAD PLANNING & EXECUTION
• ADMINISTRATIVE BURDEN

ACTIONS: • CONTINUE EFFORT TO STABILIZE DoD CEILING
• DETERMINE THE IMPLICATIONS OF THE PENDING FULL-TIME-EQUIVALENT (FTE) PROCEDURES
• REMAIN ALERT TO POSSIBLE CONGRESSIONAL EXEMPTIONS TO CEILINGS FOR INDUSTRIAL FUNDED ACTIVITIES

RECOMMENDATIONS: • SECDEF CONTINUE TO SEEK STABILIZED CEILING
• LMTF EXAMINE FTE IMPACTS ON LABORATORIES
• OSD SUPPORT REMOVAL OF CEILINGS FOR LABORATORIES FROM INDUSTRIAL FUNDED LABORATORIES
• SECDEF USE DISCRETIONARY AUTHORITY TO STABILIZE LABORATORY CEILINGS

Without doubt manpower ceiling reductions have been the greatest single factor negatively impacting the contribution of the laboratories over the past fifteen or so years. Civilian manpower allocations dominate but military spaces are equally important, particularly in the medical and Air Force laboratories.

The LMTF members expressed very deep concern about this issue, primarily from three standpoints: first, the size of reductions; second, their frequency; and third, their multiplicity. For example, the Army laboratories have been reduced in size more than one-third during the past decade; cuts have occurred every year in one form or another and are continuing; and these cuts come in several forms and at different times during each fiscal year. The turbulence and loss of effectiveness caused by this agglomeration of cuts has reached truly serious proportions.

The hire-and-fire practices generally seen in industry are not available to the DoD laboratories as a means of offsetting this instability. Personnel statutes and policies, Congressional constituent interests, and pay restrictions prevent the laboratories from accommodating cuts in an effective manner. As a result the instability has become increasingly debilitating to the laboratories.

It is the opinion of the LMTF that DoD laboratories, in the aggregate, are now at or below "critical mass" and that any further manpower reductions *cannot* be absorbed without significant negative effects on capability. Action must be taken to obtain a higher degree of ceiling stability. To the degree that this is obtained, the laboratories can institute management initiatives to more effectively meet their missions. If the cut trend is not reversed, closure of laboratories and corresponding mission and workload withdrawals quickly become the only alternative. The array of military technology areas at risk makes relief from current manpower practices an action of the highest urgency.

PERSONNEL & MANPOWER

ISSUE: • HIGH GRADE REDUCTION FOR CIVILIAN SCIENTISTS AND ENGINEERS AND ASSOCIATED LABORATORY PERSONNEL

PROBLEMS: • SEC 811(A) OF PL95-79 (FY79 AUTHORIZATION BILL) MANDATES DRAWDOWN
• CIVIL SERVICE REFORM ACT PL95-454 SAVE-GRADE PROVISION NEGATES USE OF DOWNGRADING TO MEET MANDATORY REDUCTION

IMPACTS: • RESTRICTION DISTORTS GRADE DISTRIBUTION AND MIX
• ADVERSE EFFECTS ON CAREERS PROGRESSION, RETENTION, AND HIRING
• PREORDAINS POORER QUALITY LABORATORIES IN FUTURE

ACTIONS: • REPEAL SEC 811(A) AS RECOMMENDED IN SEC 803 OF HR 6974 (FY81 AUTHORIZATION)
• MODIFY SEC 811(A) TO LIMIT OVERALL REDUCTION TO THAT ALREADY ACCOMPLISHED
• MODIFY PL95-454 TO ALLOW CREDIT FOR HIGH GRADE POSITIONS DOWNGRADED ALTHOUGH INCUMBENTS RECEIVE SAVE-GRADE
• OBTAIN EXEMPTIONS FOR GS-13'S
• CREATE DEFENSE SCIENCE AND TECHNOLOGY (S&T) SERVICE

RECOMMENDATIONS: • SECDEF SUPPORT REPEAL OF SEC 811(A) OF PL 95-79
• OSD WORK WITH OPM TO CREATE DEFENSE S&T SERVICE

Section 811(a) of PL95-79 (the Defense Authorization Act of 1978) required the DoD to reduce the number of its civilian employees in grades GS-13 through GS-18 by two percent per year from FY78 through FY80.

The Civil Service Reform Act (CSRA) of 1978 (PL95-454) requires two year save-grade for any employees downgraded since 1 January 1977, through no fault of their own. Clearly, PL95-79 and PL95-454 run contrary in intent. During the FY80 Armed Services hearings this inconsistency became apparent to the Congress and Section 817 of the FY80 Defense Authorization Act was passed to extend the time period of higher grade reductions by one year, to FY81.

Deep concern has already been expressed to the Congress by top officials of the DoD over the impacts of high grade reduction statutes. Section 803 of HR-6974 (the FY81 Defense Authorization Bill) states: "The Committee has since received evidence that the impact of further reductions in the number of supervisory and professional civilians will be detrimental to DoD capabilities, particularly in logistic and research and development functions. For this reason, the Committee recommends the repeal of Section 811(a) that otherwise would require implementation of the final phase of the reduction in FY81."

In the area of research and development, GS-13 scientists and engineers are universally regarded as being at the journeyman level. Rationally, this group should not be considered to be in "high grade" positions. Their inclusion has resulted in striking losses within grade and, equally important, severe losses in lower graded S&E's who see no future in DoD employment.

The DoD must be able to offer adequate career opportunities and status commensurate with responsibilities if it is to retain and attract the high quality talent vital to its mission performance. The criticality of the national S&E situation justifies renewed attention to a special pay group covering defense personnel in the S&E job series, in effect, a Defense Science and Technology Service.

PERSONNEL & MANPOWER

ISSUE: • SALARY COMPETITION

PROBLEMS: • NEW AND RECENT GRADUATES

– SPECIAL SALARY SCHEDULES LIMITED BY 5USC5303

– S&E GS-5/7 ENTRY LEVELS AT MAXIMUM UNDER LAW GS-9/11 LEVEL INCLUDED
BUT NOT AT MAXIMUM

• EXPERIENCED (JOURNEYMEN)

– 5USC5333 REQUIRES APPOINTMENTS AT STEP 1

– GS-11/18 HIRING ABOVE STEP 1 REQUIRES AGENCY HEAD AND OPM APPROVAL

IMPACTS: • NEW AND RECENT GRADUATES—EXISTING RATES INSUFFICIENT TO ATTRACT AND
RETAIN MOST S&E SPECIALTIES

• JOURNEYMEN—PROCESS NOT TIMELY (RESULTS IN ESCAPE OF CANDIDATE)

ACTIONS: • PURSUE ACTION WITH OPM TO ENSURE REPEAL OF SALARY SCALE LIMIT IN 5USC5303

• EXPLOIT RECENTLY DELEGATED AUTHORITY UNDER OPM BULLETIN 300-52 "ADVANCED
IN-HIRING RATES BASED ON SUPERIOR QUALIFICATIONS"

• RAISE GS-9/11 S&E TO COMPETITIVE LEVELS

RECOMMENDATION: • OSD SUPPORT BOTH OF THESE ACTIONS AND WORK TO ADJUST OVERALL S&E PAY
SCALE TO PROVIDE MARKET COMPETITION

In the area of science and engineering, Federal pay rates and policies are not comparable with private sector pay for the same level of work. Further action to offset this situation, as permitted by 5USC5301, is seriously lagging. Consequently, the current pay schedules significantly handicap the retention and recruitment of the well-qualified civilian technology personnel required within the DoD laboratory community.

In exercising the authority of the President under Section 5303(a) and (b) of Title 5 United States Code, the Office of Personnel Management (OPM) has issued Special Salary Rate Tables for Professional Engineers which start at the legal maximum (step 10 of basic GS schedule) for grades 5 and 7 and the lower steps of grades 9 and 11. This extension does not meet the pay comparability provisions of 5USC5301.

The 5USC5333 "(triple 3s)" requires that new appointments shall be made at the minimum rate of the appropriate grade. OPM regulations permit exceptions in cases of special need or extraordinarily high qualifications of a candidate. However, the process for obtaining this exception cannot be performed promptly and often the potential employee is lost. OPM Bulletin 300-52 provides a base for improving delegation of authority for advanced in-hiring rates based on superior qualifications. This delegation has recently been signed and must be implemented effectively to allow timely acquisition of qualified journeymen.

Personnel at GS-9 and 11 levels are not addressed adequately in existing procedures. The young scientist or engineer with limited graduate training or job experience is as vitally needed as any other level of employee. Provisions should be sought to ensure continuing comparability of pay for this group. Inequities also exist in the handling of Factor IV (man-in-the-job) situations which cry out for attention if we are to have any semblance of pay comparability for superior employees.

PERSONNEL & MANPOWER

ISSUE: • TRAVEL AND RECOMMENDATION LIMITS FOR MISSION RELATED WORK

PROBLEMS: • ADMINISTRATIVE TRAVEL RESTRICTED SINCE FY76 (PL94-157)
• FY80 CONTINUING RESOLUTION (PL96-86) MANDATES \$500M FEDERAL TRAVEL CUT
• DoD CUT (\$375M) NOW AFFECTS MISSION, TECHNICAL TRAVEL AND TRANSPORTATION OF THINGS (OBJECT CLASS 22) AS WELL AS ADMINISTRATIVE
• INHIBITS PERSONNEL TRANSFERS, EMPLOYMENT, LIAISON, TRAINING, AND SCIENTIFIC EXCHANGE

IMPACTS: • RESTRICTIONS DIRECTLY IMPACT PROGRAM CONDUCT AND ACCOMPLISHMENT
• FORCES INEFFICIENT USE OF FUNDS AND POSSIBLE BORDER-LINE PRACTICES

ACTIONS: • URGE CONGRESSIONAL REPEAL OF SEC 112 (PL96-86)

RECOMMENDATION: • DoD SUPPORT ACTIONS TO REDUCE MISSION IMPACTS

Section 205 of PL94-157 (the FY76 Supplemental Appropriations Act) expressed "the sense of Congress that the President, through the Director of OMB, shall take immediate steps to restrain the inflationary impact of Federal expenditures and to conserve the use of energy by ordering a reduction of Federal travel expenditures not to exceed ten percent." In FY78, the President asked for reduction of FY79 administrative travel costs by twenty percent below the 1979 budget. PL96-86 (the continuing resolution for FY80) mandated a \$500M cut across the Government.

Administrative travel has been defined in OMB Bulletin 78-18. The Senate Appropriations Committee in Report 96-393 stated that any evaluation of the amount of administrative travel that is needed to operate the defense establishment must be made separately from those categories of travel that are related to the performance of an organization mission.

Currently, the foregoing and other travel constraints are producing gross distortions in operating procedures. Laboratory managers are being forced to stretch-the-rules in an effort to avoid technical mission impacts. Their efforts are failing; the mission work is being directly impaired. The transportation of things (object class 22) is every bit as important as transportation of people in the day-to-day operation of laboratories. There is increasing case evidence that a series of well-intended budget constraints are producing counter-productive effects to the severe detriment of the DoD.

It is essential that this situation be mitigated before the impacts become irreversible.

PERSONNEL & MANPOWER

ISSUE: • INSPECTIONS AND AUDITS

PROBLEMS: • REPETITIVE, OVERLAPPING, RANDOMLY SCHEDULED INSPECTIONS AND AUDITS DIVERT TECHNICAL MANPOWER FROM PRIMARY MISSION-RELATED TASKS
• SHORT NOTICE PRECLUDES ADEQUATE PREPARATION OF RESPONSES

IMPACTS: • DELAY IN PROGRAMS
• INTERRUPTION OF TECHNICAL ACTIVITIES
• DIFFICULTY IN PROVIDING ADEQUATE RESPONSES TO LEGITIMATE CONCERN OF THE INSPECTIONS AND AUDITS ON SHORT NOTICE
• COSTLY, INEFFICIENT, AND SEEMINGLY EXCESSIVE

ACTIONS: • DEVELOP UNDERSTANDING WITH INVESTIGATING AND AUDITING BODIES CONCERNING SCHEDULES, DEMAND ON PEOPLE AND FACILITIES, AND PLANNED FREQUENCY AND DURATION OF VISITS

RECOMMENDATIONS: • OSD TAKE LEAD IN DEVELOPING UNDERSTANDING WITH ITS OWN AND EXTERNAL INVESTIGATING AGENCIES
• SERVICES DEAL WITH THE PROBLEMS ARISING FROM INTERNAL AUDITS AND INVESTIGATIONS

While little fault can be found with the concept of inspections and audits, the manner of their conduct is proving to be an increasing burden to the laboratories. This situation appears particularly bothersome for laboratories within the National Capital Region (NCR). Easy access, travel constraints, and investigator personal orientations combine to produce seeming inordinate inspections/audits of these laboratories. A not-too-different situation exists for laboratories outside the NCR. The visibility of laboratories in the RDA process probably lies at the heart of this situation. The laboratory community understands this and strives to be cooperative. However, it is being subjected to fragmented and overlapping examinations of the various functional aspects of laboratory operations. Too often, these focus on compliance with specific rules, regulations, and procedures rather than on end results and performance of the organization as a whole. Examination of the details of several such inspections/audits leads the LMTF to suggest that action be taken to secure at least a modicum of constraint and control.

ACTIONS

TAKE CORRECTIVE ACTIONS ON ADDRESSED BARRIERS

- PERSONNEL & MANPOWER
- ▷ • FACILITIES & EQUIPMENT
- PROCUREMENT & ACQUISITION

Personnel and Manpower problems are, indeed, imposing. But equally commanding are concerns involving Facilities and Equipment. Without effective tools even the best technology work force can make little contribution.

FACILITIES AND EQUIPMENT

- INADEQUATE MODERNIZATION OF LABORATORY FACILITIES
- INSUFFICIENT MODERNIZATION AND ACQUISITION OF LABORATORY EQUIPMENT

The \$4B investment of the DoD laboratories in facilities and equipment is rapidly becoming inadequate for effective mission performance. Some facilities, which are several decades old but which have received reasonable modernization through the years, remain highly useful. However, others have become, or are becoming, marginal in their utility. The equipment in these facilities is in a similar state. In some instances these tools are merely old; whereas, in other instances they are outdated and inadequate, not because of age but because of the rapid growth of technology and mission requirements. Some are very energy-inefficient. These facilities and equipment are an essential element of the work environment, and consequently greatly affect the productivity of the laboratories.

FACILITIES

ISSUE: • INADEQUATE MODERNIZATION OF LABORATORY FACILITIES

PROBLEMS: • MANY FACILITIES ARE SUBSTANDARD / INADEQUATE / OBSOLETE / ENERGY INEFFICIENT
• ADVANCING TECHNOLOGY AND NEW PROGRAMS REQUIRE APPROPRIATE FACILITIES

IMPACTS: • INHIBITS WORK PRODUCTIVITY AND SLOWS DEVELOPMENTS
• DOES NOT ATTRACT AND SUPPORT HIGHEST QUALITY SCIENTIFIC AND
TECHNICAL PERSONNEL
• REDUCES ABILITY TO PROVIDE PROGRAM AND LIFE CYCLE SUPPORT
• FACILITY CONSTRUCTION OFTEN LAGS R&D PROGRAM REQUIREMENTS

ACTIONS: • ENSURE SIGNIFICANT MONETARY INVESTMENT IN R&D FACILITIES FOR EACH SERVICE
OVER NEXT 10 YEARS

RECOMMENDATIONS: • SECDEF AND DoD ESTABLISH A LABORATORY FACILITIES MODERNIZATION POLICY TO
ENSURE REPLACEMENT OF FACILITIES IN A TIMELY MANNER SPECIFICALLY TAILORED
TO THE BUSINESS VENTURE CHARACTERISTICS OF LAB SYSTEM (AS A MINIMUM, A
FACILITIES MODERNIZATION PROGRAM FOR EACH SERVICE SHOULD BE ABOUT \$70M
EACH YEAR FOR THE NEXT TEN YEARS)
• OSD SELL THIS POLICY TO THE CONGRESS AND DoD AGGRESSIVELY MONITOR ITS
IMPLEMENTATION
• IN ADDITION, DoD SHOULD SUPPORT CONSTRUCTION OF NEW FACILITIES ON A CASE-
BY-CASE BASIS

Many of the facilities of the laboratories are the best in the western world. Many other facilities which once met such a criterion no longer qualify. No service remained immune from such deterioration. This decline seriously jeopardizes the ability of the laboratories to meet mission challenges.

A modest modernization program, geared not to mere replacement but to the needs of today and the anticipated future, would be a major positive step toward revitalization of the laboratories. A reasonable goal would be "replacement" of about one-half of the existing facilities over a ten year period. This could be accomplished if, considering inflation, about \$200M was provided by Congress for this purpose each year during the 1980's, and if major new facilities were funded over-and-above this replacement action on a case-by-case basis. Procedurally, the initial perspective is that the general limit should be set by relation to specific plan value, over time (e.g., 10-40 years), as practiced in private sector accounting. An excellent study, which can serve as a pilot for other laboratories, was prepared by the Naval Weapons Center (NWC). This study developed a time-phased facilities modernization plan for NWC.

EQUIPMENT

ISSUE: • INSUFFICIENT MODERNIZATION AND ACQUISITION OF LABORATORY EQUIPMENT

PROBLEMS: • MUCH LABORATORY EQUIPMENT IS SUBSTANDARD / OBSOLETE
• ADVANCING TECHNOLOGY REQUIRES NEW LABORATORY EQUIPMENT
• GENERAL PURPOSE EQUIPMENT PURCHASES SEVERELY LIMITED
• NO EQUIPMENT RESERVE FUND

IMPACTS: • INHIBITS WORK PERFORMANCE
• DOES NOT ATTRACT AND SUPPORT HIGH QUALITY SCIENTIFIC AND TECHNICAL PERSONNEL
• COSTLY TO MAINTAIN OLD EQUIPMENT AND WASTES MANPOWER

ACTIONS: • ESTABLISH CHARGE SYSTEM FOR EQUIPMENT DEPRECIATION
• INCREASE 6.5 RDTE LINE BUDGET FOR EQUIPMENT
• ENSURE SIGNIFICANT MONETARY INVESTMENT IN EQUIPMENT

RECOMMENDATIONS: • DoD MODIFY EXISTING REGULATIONS (E.G., DoDD 7410.4) TO PERMIT DEPRECIATION CHARGES AT APPROPRIATE LABORATORIES
• SECDEF AND DoD ESTABLISH A LABORATORY EQUIPMENT MODERNIZATION POLICY TO ENSURE THAT GENERAL PURPOSE EQUIPMENT IS REPLACED OR ACQUIRED (IF NEW) IN A TIMELY MANNER (WITH AVERAGE LIFE BASED ON IRS STANDARDS FOR PRIVATE ENTERPRISE)
• EACH SERVICE HAVE AN EQUIPMENT MODERNIZATION PROGRAM OF AT LEAST \$25-30M EACH YEAR FOR THE NEXT TEN YEARS

The capacity and capability of a laboratory to perform its assigned roles is as much a function of its equipment as it is of people or other plant operations. The manner in which laboratories are equipped is lacking, primarily because the Services principally fund programs and do not make adequate provision for general purpose/technical equipment needs. (NOTE: the Air Force is a notable exception to this; they fund their laboratories under one line item, RDTE 6.2, and provide for costs of general purpose equipment in the process. However, this 6.2 source is limited.

The DoD, in coordination with the SECDEF, should undertake to establish general purpose depreciation procedures that will provide replacement or acquisition at an adequate rate. Included in this initiative should be a SECDEF policy similar to that recommended for facilities to ensure that the modernization rate is in keeping with the needs of the laboratories and good business practices (e.g., average life of seven years, as used by the Internal Revenue Service for private sector laboratories).

ACTIONS

TAKE CORRECTIVE ACTIONS ON ADDRESSED BARRIERS

- **PERSONNEL & MANPOWER**
- **FACILITIES & EQUIPMENT**
- ▷ • **PROCUREMENT & ACQUISITION**

A primary role of the laboratories is support of systems acquisition. Performance of this function and associated support of direct in-house activities requires the laboratories to conduct extensive procurement and acquisition actions. Consequently, contracting procedures lie at the core of laboratory efforts and efficiency.

PROCUREMENT AND ACQUISITION

- DETERMINATIONS AND FINDINGS (D&F) LIMIT AND PROCESS
- CONTRACTING
- NEEDED IMPROVEMENTS IN LABORATORY FINANCIAL MANAGEMENT SYSTEMS

The contracting area is plagued with barriers inhibiting laboratory procurement actions. Institutional procedures are often highly complex and technical. Further, the Congress requires that contracting be one means for redressing societal ills (hence provisions to address small business, freedom of information, and a host of special interests).

Of these many constraints, three have been selected for initial consideration.

PROCUREMENT AND ACQUISITION

- ISSUE:** • DETERMINATION AND FINDINGS (D&F) LIMIT AND PROCESS
- PROBLEMS:** • D&F \$100K LIMIT TOO LOW (D&F HAS 1962 BASE) AND APPROVAL PROCESS TOO LENGTHY
 - USED AS PROGRAM APPROVAL DOCUMENT (NOT LEGISLATIVELY INTENDED)
- IMPACT:** • EXTENSIVE REVIEWS AT MULTIPLE LEVELS SIGNIFICANTLY INCREASE TIME REQUIRED FOR CONTRACT AWARD
- ACTIONS:** • LEGISLATIVE CHANGES TO INCREASE THRESHOLD FROM \$100K TO \$1M (52% DECREASE IN ADMINISTRATIVE BURDEN AND YET ONLY 2% OF TOTAL DOLLARS CURRENTLY UNDER D&F'S WOULD NO LONGER REQUIRE SECRETARIAL APPROVAL)
 - INCREASE THE USE OF CLASS D&F'S
 - STREAMLINE PROCESS
- RECOMMENDATIONS:** • OSD CONTINUE TO SEEK LEGISLATIVE CHANGES
 - DoD INTERIM MEASURE USE CLASS D&F'S WHEREVER POSSIBLE
 - DoD REDUCE INSTITUTIONAL REVIEWS TO ONE PER LEVEL

The Armed Services Procurement Act (10USC2311) requires that agency heads authorize negotiation of contracts involving more than \$100,000 for RDTE work. This dollar level was enacted in 1962, replacing the \$25,000 threshold established in 1948 at the inception of the Act.

The number of contracts over \$100,000 has been steadily increasing as inflation has reduced the purchasing power of RDTE funds. Determination and Finding (D&F) documentation is required for contracts to perform work pursuant to 10USC2304(a)(11). Consequently, such D&F's pass through multiple review levels to receive Secretarial approval. D&F's are often complex and this staffing time becomes significant to the time needed for contract award.

By "bulking" major planned contracts into one D&F—a class D&F—the approval process can be simplified and also used to discipline early program planning. (NOTE: the Air Force has a very effective class D&F process.) Additional process streamlining could be obtained by instituting parallel coordination procedures for all but the final approval levels.

PROCUREMENT AND ACQUISITION

ISSUE: • CONTRACTING

PROBLEM: • MANY DoD LABORATORIES ARE IMPEDED BY LACK OF DEDICATED CONTRACT SUPPORT, LIMITED IMPREST FUND AUTHORITY, LIMITED ACQUISITION AUTHORITY, AND REQUIREMENT TO FOLLOW MAJOR SYSTEM PROCUREMENT FOR NON-MAJOR CONTRACTING

IMPACTS: • UNACCEPTABLY LONG LEAD TIMES FOR PROCESSING CONTRACTS
• SERIOUS DELAYS IN RECEIPT OF SUPPLIES AND SMALL PURCHASES
• IMPREST FUND LIMIT DENIES OPERATIONAL FLEXIBILITY
• INSUFFICIENT AUTHORITY AT LABORATORY LEVEL TO PROCESS BULK OF CONTRACTUAL WORKLOAD

ACTIONS: • CHANGE POLICIES TO PROVIDE FOR ADEQUATE CONTRACTING AUTHORITY AND SMALL PURCHASE SUPPORT WITHIN LABORATORIES
• RAISE DOLLAR VALUE OF IMPREST FUND AUTHORITY FROM \$150 / 300 TO \$300 / 700

RECOMMENDATIONS: • DoD PROVIDE DEDICATED R&D CONTRACTING ACTIVITIES FOR LABS
• OSD INSTRUCT DEFENSE ACQUISITION REGULATION (DAR) COMMITTEE TO AMEND DAR IMPREST FUND THRESHOLDS
• DoD INCREASE SMALL PURCHASE FLEXIBILITY & CONTRACTING AUTHORITY

This initiative addresses several individual but somewhat overlapping problems. One particular barrier to effective laboratory contracting is the lengthening lead times on material and services being procured through consolidated/base/regional contracting offices. This centralization of procurement functions causes work stretch-outs, missed opportunity windows, reduced technological development, and—as a result of frustration—attrition of talented scientists and engineers from the laboratories. The most serious aspect of the problem overall in the laboratory community, is in the small purchase category (\$10,000 or less). The impact of constraints associated with small purchases is greatest in the technology base. Equally important is the limitation of contract authority at some laboratories (particularly in the Navy).

Imprest fund thresholds have not kept pace with inflation. Defense Acquisition Regulations (DAR) need revision.

PROCUREMENT & ACQUISITION

ISSUE: • NEEDED SPECIAL FINANCIAL MANAGEMENT SYSTEMS FOR LABORATORIES

PROBLEMS: • INDUSTRIAL FUNDING, ALTHOUGH A GENERALLY EFFECTIVE FINANCIAL SYSTEM, DOES NOT ADEQUATELY ADDRESS BARRIERS SUCH AS:
• RATE STABILIZATION • INCREMENTAL FUNDING
• CONTINUATION OF WORK AT THE BEGINNING OF A NEW FISCAL YEAR
• MULTIPLE FUNDED CUSTOMER ORDERS • FRAGMENTATION OF FUNDING
• COMMITMENT AND OBLIGATION LEGAL LIABILITIES

IMPACTS: • DELAYS IN WORK ASSIGNMENT • LOSS OF PERSONNEL PRODUCTIVITY
• UNFAIR CHARGES TO CUSTOMERS • IMPRECISE "REAL COST" ANALYSES
• MICRO FISCAL CONTROL SERVING LITTLE USEFUL PURPOSE

ACTIONS: • ESTABLISH A "SERVICE FUND" APPROACH FOR SELECTIVE USE
• APPLY TO ALL INDUSTRIALLY FUNDED LABORATORIES (ARMY AND NAVY)

RECOMMENDATIONS: • DoD USING NAVY SERVICE FUND STUDY AT A POINT OF DEPARTURE ESTABLISH AND IMPLEMENT THE SERVICE FUND CONCEPT

The original intent of Industrial Funding in DoD was slanted toward commercial/industrial activities such as depot-level maintenance facilities (e.g., shipyards, aircraft re-work facilities). Currently, OSD policies and procedures for managing such activities often do not fit R&D activities but cause laboratories operating under the industrial fund to confront constraints which, in many cases are counterproductive.

All Navy laboratories (except medical) operate under the industrial funding concept. About one-fifth of the Army laboratories are under industrial funding. The Air Force tried industrial funding at one activity some years ago, did not like it, abandoned it, and now uses "Block" institutional funding. The industrial funding concept gives R&D activities three useful management tools: (1) a working capital fund, (2) a cost accounting system, and (3) a "buyer-seller" relationship between the laboratory and its customers, with charging of all allowable costs (e.g., direct, cost center overhead, general, and administrative expenses) to the specific benefiting users.

One alternative to industrial funding for (Navy) laboratories is the Resources Management System (RMS). One major drawback of the RMS is that it does not provide a working capital fund, a device particularly useful for laboratories.

The Navy has conducted a preliminary study of a modified system which is termed "Service Fund." This system builds upon the flexibility provided in 10 USC 2208, which provides for "commercial-type" activities as well as industrial-type activities. The establishment of a separate set of procedures under the umbrella of "commercial-type" activities could better provide for the working capital needs of laboratories. Such an approach avoids dilution/change to existing industrial fund policies and regulations and can be adopted by any Service as a stand-alone financial management system if the Service and OSD concur.

ESSENTIAL ACTIONS

- TAKE CORRECTIVE ACTIONS ON ADDRESSED BARRIERS
- • CONTINUE WORK TO IDENTIFY AND ADDRESS REMAINING BARRIERS
- ADOPT SELECTIVE APPLICATION PRINCIPLE FOR LABORATORIES
- PROVIDE FOLLOW-THROUGH ACTION AT OSD AND SERVICE LEVELS
- MONITOR PROGRESS
- ASSESS LABORATORIES VITALITY OVER TIME

KEY-ISSUANCE OF:

DoD

LABORATORIES

ACTION AGENDA

FOR THE 1980'S

In addition to the barriers addressed in detail thus far, the LMTF also identified a lesser group of concerns. Several representative concerns are shown for the primary barrier areas on the next three charts. It is the intent of the LMTF to continue its work by addressing these and other yet to be identified concerns, to better ensure that intensive management attention is given to all barriers significantly inhibiting the vitality of the DoD laboratories.

**PERSONNEL & MANPOWER
OTHER CONCERNS**

- OVERTIME CONTROLS
- CEILING ON EMPLOYMENT IN NATIONAL CAPITAL AREA
- SES / MERIT PAY APPRAISAL TIMING - DoD PERIOD OF 1 JULY - 30 JUNE IS NOT COINCIDENT WITH 1 OCTOBER - 30 SEPTEMBER FISCAL YEAR

FACILITIES AND EQUIPMENT

OTHER CONCERNS

- RAISE LIMIT ON LOCAL APPROVAL FOR USE OF RDT&E FUNDS FOR FACILITIES FROM \$100K TO \$500K FOR APPROPRIATIONS AVAILABLE FOR OPERATION AND MAINTENANCE
- AMEND 10 U.S. CODE 2353 TO PERMIT THE SAME DEGREE OF FREEDOM TO BUILD FACILITIES IN-HOUSE AS AT CONTRACTORS

**PROCUREMENT & ACQUISITION
OTHER CONCERNS**

- NEED FOR MULTIPLE YEAR FUNDING OF TECHNOLOGY BASE CONTRACTS
- LACK OF DIFFERENTIATION BETWEEN TECHNOLOGY BASE AND MAJOR PROCUREMENT PRACTICES
- NEED FOR STREAMLINED NEGOTIATIONS

ESSENTIAL ACTIONS

- TAKE CORRECTIVE ACTIONS ON ADDRESSED BARRIERS
- CONTINUE WORK TO IDENTIFY AND ADDRESS REMAINING BARRIERS
- • ADOPT SELECTIVE APPLICATION PRINCIPLE FOR LABORATORIES
- PROVIDE FOLLOW-THROUGH ACTION AT OSD AND SERVICE LEVELS
- MONITOR PROGRESS
- ASSESS LABORATORIES VITALITY OVER TIME

KEY-ISSUANCE OF:

DoD
LABORATORIES
ACTION AGENDA
FOR THE 1980'S

The current constraints on personnel and dollar resources in the face of readiness, modernization, and sustainability needs, places the Services in a series of dilemmas. The requirement to constantly choose between unsatisfactory alternatives is particularly apparent in the Service materiel communities. Senior management must balance R&D, procurement, logistics, maintenance, and a host of other functions to achieve even the semblance of a coherent whole. The choices are tough and rarely palatable. Understandably, these managers are hesitant to "favor" one function at the "expense" of any other. Further, short-term urgencies tend to work against actions supportive to the laboratories multiple roles.

However, the challenge and the urgency are upon us. We see the Soviets entering the decade of the 1980's with a commitment to compete in *quality* with U.S. weapon systems. They have already made a major start in that direction, with the acceptance of the high cost in personnel, facilities, and weapons implied by this commitment. That they plan to continue this emphasis into the 1980's is clear.

The challenge to us is formidable. The LMTF is convinced that the DoD must make a major change in its management of defense technology if we are to maintain a superior technological base, and a competitive and productive industrial and academic team. In order to do this, we recommend that a principle of selective application be instituted in the DoD, with initial application on critical laboratory issues. We believe that this Principle, applied selectively, offers great leverage—a few relatively small changes, in the right places, at the right time, can greatly help to ensure the vitality of DoD laboratories. We believe that this Principle can be applied consistently through the early 1980's without jeopardizing other vital DoD functions and without serious intrusion on the prerogatives of the Military Departments. The Selective Application Principle is set forth in the next slide.

SELECTIVE APPLICATION PRINCIPLE

THE DoD LABORATORIES ARE A KEY AGENT IN ENSURING EFFECTIVE DEFENSE-ORIENTED TECHNOLOGY PROGRAMS. PRIMARY EFFORTS MUST BE FOCUSED ON IMPROVING MANAGEMENT OF OUR SCIENTIFIC AND TECHNOLOGICAL RESOURCES AND ON EXPANDING OUR TECHNOLOGICAL OPTIONS. ACCORDINGLY, THE OSD AND THE MILITARY DEPARTMENTS WILL ADOPT THE PRINCIPLE OF SELECTIVE APPLICATION TO LABORATORIES OF POLICIES AND PROCEDURES WHOSE RIGID APPLICATION INHIBITS EFFECTIVE PERFORMANCE OF ESSENTIAL LABORATORY ROLES. THIS AD HOC POLICY SHALL BE A PRINCIPLE MEANS FOR PROVIDING SIGNIFICANTLY INCREASED AUTHORITY AND FLEXIBILITY TO LABORATORY MANAGEMENT.

ESSENTIAL ACTIONS

- TAKE CORRECTIVE ACTIONS ON ADDRESSED BARRIERS
- CONTINUE WORK TO IDENTIFY AND ADDRESS REMAINING BARRIERS
- ADOPT SELECTIVE APPLICATION PRINCIPLE FOR LABORATORIES
- ▷ • PROVIDE FOLLOW-THROUGH ACTION AT OSD AND SERVICE LEVELS
- ▷ • MONITOR PROGRESS
- ▷ • ASSESS LABORATORIES VITALITY OVER TIME

KEY-ISSUANCE OF:

**DoD
LABORATORIES
ACTION AGENDA
FOR THE 1980's**

Follow-through, monitoring, and assessment are inherent steps to the resolution of barriers. Considerable attention has been given to these steps by the LMTF. The details of these deliberations will not be given here because of their complexity. The following three slides summarize the intent of each action step.

FOLLOW-THROUGH

THE APPROVED LABORATORY RESOURCE MANAGEMENT PLANS OF THE SERVICES PROVIDE A BASE FOR FOLLOW-THROUGH WITHIN EACH SERVICE. THESE PLANS ADDRESS SPECIFIC MANAGEMENT CONCERNS TO WHICH THE LMTF INITIATIVES APPLY. THE LMTF WILL IDENTIFY CONTINUING ISSUES AND WORK THROUGH DoD MANAGEMENT TO ACHIEVE THESE CHANGES THAT CANNOT BE WORKED BY THE SERVICES.

MONITORING

THE LMTF WILL SERVE AS A DoD BODY FOR PROGRESS REVIEW. IT WILL ASSESS SPECIFIC PROGRESS IN REMOVAL OF BARRIERS TO EFFECTIVE MANAGEMENT IN THE DoD LABORATORY SYSTEM AND ENCOURAGE THE MILITARY DEPARTMENTS TO SIMILARLY MONITOR SERVICE-UNIQUE ACTIONS.

ASSESSMENT

ASSESSMENT WILL TAKE TWO FORMS:

- INDIVIDUAL LABORATORIES WILL BE ENCOURAGED TO PERFORM SELF-ASSESSMENTS OF THE IMPACT OF BARRIER REDUCTION ON THEIR EFFECTIVENESS. THE LMTF WILL PROVIDE GUIDELINES TO ASSIST THIS SELF-ASSESSMENT
- THE LMTF MEMBERS WILL CONDUCT SELECTED ASSESSMENTS TO DETERMINE IF CORRECTIVE MEASURES ARE EFFECTIVE—AND FOCUS ATTENTION UPWARD THROUGH OSD AS WELL AS DOWNWARD TOWARD THE LABORATORIES

ESSENTIAL ACTIONS

- TAKE CORRECTIVE ACTIONS ON ADDRESSED BARRIERS
- CONTINUE WORK TO IDENTIFY AND ADDRESS REMAINING BARRIERS
- ADOPT SELECTIVE APPLICATION PRINCIPLE FOR LABORATORIES
- PROVIDE FOLLOW-THROUGH ACTION AT OSD AND SERVICE LEVELS
- MONITOR PROGRESS
- ASSESS LABORATORY VITALITY OVER TIME

⇨ **KEY-ISSUANCE OF:**

**DoD
LABORATORIES
ACTION AGENDA
FOR THE 1980's**

Much of the DoD laboratories scene is excellent and promotes defense capability. However, to an increasing extent, the quality and vigor of life in the laboratories is diminishing. Restoring the quality of the laboratories is a partnership problem. The LMTF has recommended, and will continue to seek out, steps which are necessary to improve the present and anticipated situation. The OSD and the Military Departments can do much to make the system work better. The laboratories themselves must work even harder to explore ways to make the system more effective. The private sector also shares in closing the gulf. If any element is stereotyped as "good guys" while others are branded as "bad guys" the whole process will suffer.

There are many points of friction; many gaps in understanding. Some are documented; some are rumor. An apparently inexorable tide of bureaucracy and sub-optimized interest seemingly engulfs the situation. Positive action is an imperative. As a step in this direction, the LMTF offers a DoD Laboratories Action Agenda for the 1980's, to encourage in a formal way, imaginative action at every level of the DoD. We must work together more intensively for our common good. Now is the time to act.

**DEPARTMENT OF DEFENSE
WASHINGTON, D.C.**

**STATEMENT OF PRINCIPLES
FOR
DEPARTMENT OF DEFENSE
RESEARCH AND DEVELOPMENT LABORATORIES**

The guiding goal for the Defense laboratories is to achieve and maintain a level of technological supremacy that enables the United States to develop, acquire, and maintain military capabilities needed for national security. These Centers-of-Excellence complement universities and industry as a vital resource of the Nation.

OBJECTIVES

Mission

- Ensure the maintenance and improvement of national competence in areas of technology essential to military needs; avoid technological surprise.
- Maintain a continuity of effort, free from excessive commercialization pressure, directed toward the conception and evolution of advanced military materiel.
- Pursue technology concepts through the planning, programming, and budgeting process for support of direct in-house work and for potential contract placement, monitoring, and assessment.
- Provide material acquisition and operating system support.
- Have available a fast-reaction capability to solve critical, immediate technical problems that arise when unexpected operational situations are encountered.
- Stimulate the use of prototypes to mature and exploit U.S. and allied technologies.
- Carry out activities having extraordinary risk or requiring intensive resource investment not available from the private sector.

Operations

- Respond to national defense needs by undertaking actions to—
 - Achieve timely improvements in materiel systems
 - Reduce manpower and skill constraints on material performance
 - Lower production, operation, and support costs for materiel
 - Extend life of operational systems
- Continue intensive user-developer interfacing to—
 - Achieve greater sensitivity to potential combat requirements
 - Integrate technological objectives with materiel readiness, modernization, and sustainability requirements
 - Evolve effective balance between technology push and requirements pull

- Continue a vigorous partnership with industry and the academic community
- Distribute efforts appropriately across short-, mid-, and long-term horizons
- Participate actively in the overall Defense planning process

Management

Provide laboratory management with the responsibility, authority, and flexibility to manage laboratories and technical programs through use of broad guidelines and without overlapping controls.

- Ensure Competency of *Personnel*
 - Recognize clearly that the most valuable resources of the laboratories are the capability, skill, and creativity of their personnel
 - Provide for personnel stability, challenging work, and meaningful incentives
 - Provide for equal opportunity for development, training, promotion, recognition, and reward
- Upgrade *Facilities and Equipment*
 - Remove limitations which constrain modernization of laboratories
 - Promote productivity, energy efficiency, and cost avoidance through policies that modernize facilities and equipment
 - Base replacement policies on practice that befits the business venture nature of research and development activity
- Provide Effective Procedures for *Procurement and Acquisition*
 - Provide laboratories with the authority to make procurements and acquisitions in a timely and efficient manner
 - Ensure technical excellent in performance
- Achieve Continuing *Assessment and Accountability*

The Office of the Secretary of Defense and Military Departments will be jointly responsible for establishing policies and procedures which are conducive to the continuing vitality of the laboratories. Accordingly, periodic evaluations will be conducted to assess the health of the laboratories, the quality and quantity of their contributions, and their performance against the public's legitimate expectations of efficient and effective use of personnel and dollar resources.

SYNOPSIS OF SERVICE LABORATORY RESOURCE MANAGEMENT PLANS

In accordance with the memorandum of the Secretary of Defense establishing the DoD laboratory management task force, the Military Departments developed draft plans addressing the management of their laboratory resources. These plans are clear evidence that the services recognize the urgency of maintaining effective laboratories. The plans provided identification of the respective laboratory roles. They reflected deep concern for issues involving manpower size and mix, facility and equipment adequacy, and selected institutional procedures. These plans provide a base for follow-through on the LMTF proposed initiatives.

(See attached Synopses of Army, Navy, and Air Force Plans)

SYNOPSIS OF: ARMY LABORATORIES MANAGEMENT PLAN EXECUTIVE SUMMARY MARCH 1980

The Summary provides top-down insight into the Army's perspectives on management of its laboratories. The Plan contains a host of innovative actions, some on-going, some yet to be addressed, aimed at a single issue—how can/will the Army increase the effectiveness of its manpower and dollar expenditures for laboratories. Clearly, the Army fully recognizes the need to revitalize its laboratories and has developed dynamic approaches for achieving this goal. The Army has an action agenda for the 1980's which is challenging and hard-hitting. As this Plan matures and is implemented in its details, considerable improvement in the vitality of Army laboratories should surely result.

1. The Summary addresses a broad array of factors essential to the effective mission performance of the Army in-house laboratories. It achieves three primary aims:

- a. Provides a detailed basis for ensuring a current understanding of the roles of Army laboratories and recognition of their relationship to other Army functions.
- b. Summarizes representative issues critical to the vigor of these laboratories.
- c. Highlights approaches the Army is using to further intensify management of its laboratories. The Summary is organized to provide top management with focused information in selected areas. Resource breakouts are kept to a minimum. Individual laboratories are not discussed. A fundamental thrust of the Army Plan is to minimize formal report actions with the intent of achieving a living, breathing environment conducive to dynamic planning and vigorous contributions by the laboratories.

2. The Summary clearly provides for Army action to address four concerns:

- a. Better ensuring the relevance of the work in the laboratories.
- b. Improving facilities and staff.
- c. Uplifting the quality of technical leadership and management in the laboratories.
- d. Ensuring leadership improvements in the authority and flexibility to effectively manage laboratory resources.

3. A profile of the Army's 34 formally recognized military laboratories is given and their aggregate roles are undisputedly specified. The Summary views issues affecting Army laboratories in three segments:

- a. Image
- b. Operations
- c. Long-term perspectives

Representative problems associated with these segments are itemized.

4. The Army Summary addresses these concerns and issues with two highly action-oriented interrelated thrusts:

- a. A perspective structure encompassing the elements critical to effective management of its laboratories by the Army.
- b. A participative Research, Development, and Acquisition (RDA) planning process and product to provide general and specific RDA direction to the laboratories through the next two decades and to provide a base against which their individual and collective needs and contributions can be "measured."

5. The perspective structure provides for analyses of the posture of Army laboratories in four areas:

- a. Need
- b. Capability
- c. Performance
- d. Planning/Plan

This perspective provides an excellent approach for integrating the Army laboratories with the Total Army.

6. The dominant thrust for achieving this integration is a Long-Range RDA Plan/Investment Strategy. The Summary is supported by an extensive Appendix outlining the Army's actions to achieve this Plan. Review of the Appendix reveals a host of actions directed toward the development and maintenance of a stable Long-Range R-A Plan responsive to total Army capability needs and opportunities. Initial actions have already significantly influenced the Army's POM 82-86 preparation. The first formal Long-Range RDA Plan is targeted to assure responsive Science and Technology, Systems Development, Product Improvement, and Procurement Plans for integration into the POM 83-87 including the Extended Planning Annex for FY88-89. Summary of the Appendix follows.

7. The Army Summary also provides a basis for addressing the four concerns mentioned in paragraph 2 above. This set of over twenty initiatives is focused on specific areas for laboratory improvement and, in the aggregate, they cover the spectrum of matters appropriate for Army attention.

SUMMARY OF APPENDIX ON LONG-RANGE RDA PLANNING

Intensive attention is being given to improving Army long-range RDA investment strategy. Appropriate steps are being taken by the Army Secretariate, DA Staff agencies and offices, and user and developer field organizations. An attitude of urgency and realism is clearly evident.

The dominant thrust is one of mission-orientation. This approach reflects responsiveness to the direction of the Congress, Office of Management and Budget, and Office of the Secretary of Defense, requiring that Army needs and program objectives be expressed in mission terms. The long-range RDA planning actions are being conducted with coordinative attention to major related planning in OSD and the other Military Departments. For example, close contact is being maintained with the Long-Range Research and Investment Planning Program recently initiated by the Deputy Secretary of Defense and the Under Secretary of Defense Research and Engineering.

Although operating on the premise that long-range RDA planning must be conducted as a continuum, direct action has been taken to interface with the PPB System. Significant inputs were integrated with the FY82-86 POM and action is underway to impact POM 83-87.

Two goals have been proposed by the ASA(RDA) as targets for RDA attention:

- Fielded technological equivalence by 1985.
- Fielded technological superiority in the 1990's.

These goals have been well received by the RDA community and are becoming effective driving thrusts. Direct participation from independent sources has been sought and is being provided. For example: the Army Science Board devoted its Summer Study to RDA planning and the American Defense Preparedness Association conducted a two-day symposium for industry and international representatives on Concepts and Requirements for Army Weapon Systems.

Recent emphasis on long-range RDA planning has resulted in important improvements in user-developer interaction on a mission basis. This improved dialogue will better ensure that mission needs are correlated with realistic doctrinal, organizational, and technological alternatives. The planning approach includes the development of Mission Area Analysis and Mission Area Science and Technology Plans by joint user-developer teams. This work is providing improved focus on:

- Battlefield Shortfalls
- Battlefield Opportunities
- Technological Opportunities

Specific actions are being directed to provide a dynamic but stable long-range 15-year RDA planning process with a product in a form usable by top management. Present efforts are strongly oriented to establishing the process, but it is fully recognized that the ultimate goal includes a workable product. To the maximum extent practicable, on-going Phase I MAAs and S&T Plans were available to assist in preparation of the POM 82-86. Phase II MAAs and responsive S&T Plans will be completed prior to the POM 83-87, and integrated into a formal Long-Range RDA Plan.

The Army has identified a shortcoming in its RDA process and taken corrective action. Until recently RDTE funds could not be expended for Product Improvement until a system was type classified. Action has been taken to remove this constraint and to initiate a concept of Block Design Product Improvements which offers the opportunity to field systems with overlap and thereby achieve technology insertion and better protection of the material investment.

There is good recognition of the deficiencies in the status of current long-range RDA planning and assertive action to institute steps to achieve the necessary levels of improvement. The Army laboratory communities (material, medical, engineer, and personnel) are all working to provide imaginative inputs to the Long-Range RDA Plan and to respond to the work thrusts resulting from the long-range planning process.

NAVY LABORATORY RESOURCE PLAN
DRAFT, MARCH 1980
A SYNOPSIS

The Navy Laboratory Resources Plan covers the 8 Chief of Naval Material-Commanded Laboratories, the Naval Research Laboratory, the Naval Oceanographic Research and Development Activity, and the Naval Civil Engineering Laboratory. These are the major Navy Laboratories. Not covered in this plan are Navy Medical Laboratories and RDTE Activities that are attached to the Naval Material Command Systems Commands. The Navy Laboratories covered in this plan have the following characteristics:

- Full-spectrum laboratories (6.1) — Procurement-Operations & Maintenance
- Industrially funded
- Preponderantly civilian work force
- Relatively large (greater than 1000 people)
- Strong orientation to naval platform and mission
- 70% total (about 50% tech base) funds are passed through to industrial contractors
- Major components of the Navy Acquisition Process
- Federation of closely cooperating activities

The Navy Laboratory Resources Plan details the Navy's corporate approach to effective use of available R&D resources. The greatest common concern in the Navy Laboratories centers about the problems of maintaining the technical excellence and diverse capabilities under conditions that make it increasingly difficult to recruit and retain highly qualified people.

The plan summarizes recent technical achievements of the Navy Laboratories in tech. base, development, procurement, and fleet support categories.

Roles, missions, and management of Navy R&D Centers.

- Continually assessed in view of continuing changing environment
- Anticipate long-range impact of Federal Policies (A-76, A-109)
 - Transfer of additional work to private sector
 - Industrial involvement at early stages of acquisition process
- Objective for Navy to remain a sophisticated buyer, to continue to improve management of Navy acquisition, to maintain a quick-reaction RDTE capability
- Above requires strong, in-house, hands-on R&D effort to attract competent scientists and engineers
- There are management problems that are associated with initiation, termination, and transfer of technological effort, e.g., tech. base to development

- Navy laboratories are aggressively implementing Senior Executive Service and CSRA-78 and are oriented to management by objectives

Technology base is vital to systems acquisition and support; in-house capability in the Navy is eroding—coupled with the shift of laboratory manpower to non-tech. base, and non-RDTE funded efforts. Reversing these trends is essential to maintaining the integrity and vitality of the Navy laboratories.

Navy Laboratory Centers are providing more support to Program Management Offices in System Development. Efforts are being aligned with the technology base so as to provide efficient transition up the development chain. Such alignments reverse an earlier trend to minimize the laboratory contribution in Systems Development.

Achieving proper balance among the tech. base, system acquisition, and fleet support remains a challenge to management at the individual laboratories—a challenge that is underscored by the erosion of the tech. base work mentioned above.

The prospect of real growth in Navy R&D presents something of a dilemma to Navy Laboratory managers. Because of personnel ceilings it has become necessary to rely increasingly on industry to absorb additional laboratory work loads. Further increases in contracting out could result in changing the basic characteristic of laboratory operations with the attendant losses of competent scientists and engineers.

Industrial funding exacerbates the rate at which imbalances among the various categories of work—tech base, advanced development, fleet support, etc.—arise. The reexamination of the applicability of current industrial funding practice is very important to the Navy Laboratory System.

The tendency toward centralization in procurement, contracting, and even in providing automatic data processing equipment has resulted in excessive time and effort in justifying and defending new ADP procurement and applications. All this is in the face of the repeated demonstrated fact that productivity of R&D centers can be further increased by new and imaginative uses of the latest available ADP. The Navy has prepared a Five Year ADP Plan.

PERSONNEL RESOURCES

- Most important single class of resource
- Predominant concern
- Serious erosion of morale and of quality professional work force results from recent history of freezes, ceilings, reductions in force, and other factors tending toward instability.
- The NOSC-NWC Personnel Management Demonstration Project that begins in 1980 is a major initiative in using new approaches to job classification assignments, pay, and incentives to bring about major improvements in the ability to recruit, retain, and utilize high quality professionals.
- Navy R&D Centers are attempting to improve utilization of military personnel although, since their quest is for operationally experienced R&D-oriented project personnel, the R&D Centers are in competition with each other.

This is the Navy Laboratory Resource Management Plan response to the DoD Laboratory Task Force Initiatives to Resource Barriers to Effective Management:

- Working Groups of the DoD Laboratory Management Task Force identified issues in the various fields of personnel, procurement and acquisition, and military construction and facilities. The Navy Plan comments on these issues have been summarized above.

- The Navy Plan amplifies and addresses the issues and sets out conclusions, recommendations, and action alternatives to mitigate the problems that are identified.
- The Navy members of the DoD Laboratory Management Task Force Working Group are working with the Army, Air Force, and OSD counterparts to revise directives and authorities where applicable to prevent corrective actions.
- Through the Navy Laboratory Corporate Plan the Director of Navy Laboratories promulgates corporate goals, objectives, and initiatives on an annual basis.
- Management profiles on the component Navy Laboratories are provided in the Navy Laboratory Resource Plan.

AIR FORCE LABORATORY RESOURCE PLAN
31 MARCH 1980
A SYNOPSIS

- The Air Force Laboratory Resource Plan projects laboratory programs and the resources necessary for program implementation.
- Noting that availability of resources is a necessary but not sufficient condition for program success, the Air Force Laboratory Resource Plan describes briefly the effects that some constraints and barriers to effective laboratory management, that have been addressed by the DoD Laboratory Management Task Force, are having on the Air Force in the performance of the technology mission, and on the vitality of the laboratories.
- The Air Force Laboratories receive about 75% of their funding from the Director of Science and Technology at Air Force Systems Command Headquarters. Laboratory programs are organized along Technology Program Objective lines. The Air Force plans for 10% real growth each year in basic research and 5% real growth per year in exploratory development. Military personnel comprise about 30% of the technical work force—a much higher fraction than is found in the Army and Navy Laboratories. Salaries for military personnel are not included in laboratory budgets; but civilian salaries are. Air Force Laboratories are not industrially funded.

MANAGEMENT

Constraint Effects on the Air Force Laboratories (categories are those of the DoD Laboratory Management Task Force):

- Personnel
 - Civilian ceilings are acceptable if somewhat constraining
 - Air Force Laboratories operate under stable personnel authorizations
 - Salary comparability a concern—Air Force Laboratories affected by salary structure and its resultant effect on recruitment and retention of quality people
 - Low promotion potential contributes to loss of work force quality
 - Must create personnel environment comparable to that existing in other R&D activities
- Military Construction and Facilities
 - Obsolescence of facilities and equipment and the need for new research capabilities present increasingly severe problems for the Air Force Laboratories
 - Changing technology missions of Air Force Laboratories not adequately supported
 - Corrective action required to prevent unacceptable erosion of Air Force Laboratory capabilities
- Procurement and Acquisition
 - Thresholds for requirement of Secretarial Determinations and Findings (D + F) and for imprest funds overly restrictive due to inflation
 - Results in increased delays and paperwork

- Purchase from imprest funds similarly affected
- Procurement and acquisition problems in laboratories exacerbated by
 - Absence of dedicated R&D buyers
 - Imposition of standard supply procedures for R&D purchase orders
- Above all present barriers to effective management of laboratory programs.



THE SECRETARY OF DEFENSE
Washington, D.C. 20301

MEMORANDUM FOR SECRETARIES OF THE MILITARY DEPARTMENTS
UNDER SECRETARY OF DEFENSE FOR RESEARCH AND
ENGINEERING
ASSISTANT SECRETARY OF DEFENSE (COMPTROLLER)
ASSISTANT SECRETARY OF DEFENSE (MANPOWER, RESERVE
AFFAIRS AND LOGISTICS)
DIRECTOR, DEFENSE ADVANCED RESEARCH PROJECTS AGENCY

SUBJECT: DoD Laboratory Management

The quantity and quality of military systems being fielded by the Soviets demand improved management of our scientific and technological resources, to expand our technological options.

Last year, the Deputy Under Secretary of Defense for Research and Engineering (Research and Advanced Technology) initiated an inter-Service review, to identify institutional barriers on the DoD Laboratories' ability to accomplish their missions. The review identified a number of barriers to effective laboratory management that limit the efficient use of our resources.

I would like each Service to develop a laboratory resources plan for each lab, that provides for increased management authority to utilize more effectively personnel and fiscal resources. Plan should include a means for the continuing evaluation of managerial use of the flexibility and latitude provided. These plans should be completed by the end of March, 1980 and submitted to the Deputy Under Secretary of Defense for Research and Engineering (Research and Advanced Technology) for approval. Upon approval, unnecessary administrative restrictions upon the exercise of managerial discretion should be removed from the laboratory operations. I intend this action to establish reasonable boundaries for laboratory management's discretionary use of resources.

I am establishing a DoD Laboratory Management Task Force, chaired by the Deputy Under Secretary of Defense for Research and Engineering (Research and Advanced Technology), to oversee our continuing efforts toward improving the vitality of our laboratories. An important function of this Task Force will be to review and approve the Service plans and take the necessary follow-up action to achieve our goals in this vital area. I would like each addressee to nominate a principal and at least one working level representative to the Task Force by mid-October, 1979.

Harold Brown

Attachment

**DOD LABORATORY MANAGEMENT TASK FORCE (LMTF)
PARTICIPANTS**

OFFICE SECRETARY OF DEFENSE

Dr. Arden Bement, DUSDE(R&AT)
Mr. Albert Bottoms, DUSDE(R&AT)
Ms. Kathleen Carpenter, DASC(MRAL)EO
Dr. George Contos, OSD(MRA&L)
Mr. Nelson Eaton, OSD Comptroller
COL. Tenho Hukkala, OUSDRE(R&AT)
Dr. George Millburn, OUSDRE(R&AT)
Mr. Gordon Sigman, DARPA/TTO
Dr. James Tegnelia, DARPA/TTO
Mr. Charles Weatherholt, OASD(CPP)

ARMY

Dr. Eugene Yore, OASA(RDA)
MAJOR Kearney Crissman, DAMA-PPR-P
Mr. James Spates, DAMA-ARZ-C
Dr. Robert Wiseman, DARCOM-DRC-DMD/ST

NAVY

Dr. James Probus, DNL, MAT 08L
Dr. Alan Berman, TD, NRL
Mr. Ken Boyd, Code D2B, NSWC
Mr. Walter Clearwaters, Code 20, NOSC
Dr. Kenneth Lobb, TD, NADC
Dr. Charles Schoman, Code 011, DTNSRDC
Mr. Stuart Simon, Code 702, NADC
Mr. George Swiggum, Code MAT08L31

AIR FORCE

Dr. Walter Beam, OASAF(RD&L)
LTCOL. Hugh Bainter, AFSC/DLZ
COL. Thomas Ferguson, AFSC/DL
Dr. Bernard Kulp, AFSC/DLZ
Mr. Robert Supp, AFWAL/PO
BG. Brien Ward, Director S&T, AFSC

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Technical Director, AFOSR

Director of Laboratories, AFSC

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US Army Material Development and Readiness Command

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US Army Materials and Mechanics Research Center

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US Army Research Institute of Environmental Medicine

Walter Reed Army Institute of Research

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Commander
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